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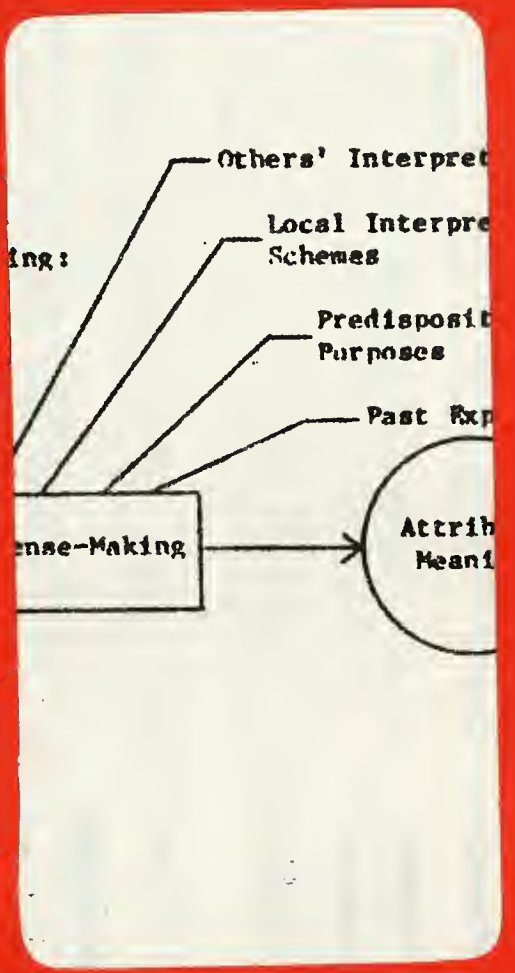
STATE RAIL PLANS

John F. Due, Professor, Department of Economics

#564

Transportation Research Paper #18

College of Commerce and Business Administration
University of Illinois at Urbana-Champaign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Summary:

The enactment of the 3R and 4R Acts by Congress led the states to develop rail plans in order to qualify for Federal assistance for the retention of lines excluded from CONRAIL or subsequently abandoned. The majority of the states have now issued their plans, and the 3R area states have completed their third updates. The states differ very widely in their attitudes toward the excluded and endangered light traffic lines. The New England states, most mid-Atlantic states, and several midwest states have planed an active role in attempting to save light traffic lines. Several of the western and southern states, however, have been unsympathetic to any active role in retaining lines that would otherwise be abandoned. Examination of the excluded and endangered lines on the basis of information in the state rail plans shows a considerable iileage with benefits of retention in excess of costs, but many of these require continuing subsidy. Most states, however, regard the subsidy program as only transitional and are emphasizing rehabilitation of lines rather than operating subsidies.

State Rail Plans*

John F. Due
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In the last century, various states, in an effort to speed economic development, encouraged the building of railroad lines and in some instances constructed lines themselves. Michigan, for example, built two lines, later sold to predecessors of the New York Central;[1] Illinois had several major projects but built relatively little; Pennsylvania, North Carolina, Georgia, and other states were also involved. But no state continued to operate these lines (although Georgia has retained ownership of its line). Cities also undertook construction, Baltimore (Western Maryland), and Cincinnati (Cincinnati Southern, now operated as part of the Southern Railway system) being the prime examples, but they likewise did not operate them. The states moved on from promotion to regulation, commencing in New England, and then in the midwest (the Granger laws) and California, but in turn gradually lost most of their regulatory powers to the Interstate Commerce Commission. Thus by the 1960s the states regarded the railroads essentially as objects to tax and to regulate in the few ways left to them, not as an activity to promote or assist or even consider how they were affected by other state policies such as highway building. When railroads attempted to abandon lines the states and particularly the local communities fought the proposals but did not come up with other alternatives.

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*This paper is based upon work prepared by the author for the National Transportation Policy Study Commission and is used by permission of the Commission. The material in no way reflects the views of the Commission or its staff. The author is indebted to Professor Robert Harris of the University of California, Berkeley, for his comments on an earlier version of the paper.

[1] Robert J. Parks, Democracy's Railroads, (Port Washington, NY: Kennikat Press 1972).

The Beginnings of Change

With the decline in railroad profitability, particularly in the east and northeast, and threatened loss of substantial rail mileage, slight indications of change were evident. The abandonment of the Rutland, one of the three most extensive rail abandonments to occur to that date, led the state of Vermont to act and buy the main line in 1963-64, leasing it to two operating firms. In the same period, the state of New York bought the Long Island Railroad, primarily a commuter operation but also a freight carrier, and turned it over to the Transit Authority for operation. When Amtrak was established, the law contained provisions for operation of additional trains under state subsidy, and New York, Pennsylvania, Michigan, California, Illinois and Minnesota participated in the program.

But the major change came with the collapse of the Penn Central and the 3R and 4R legislation. The acts provided for a system of Federal subsidy for light traffic lines that the states and/or local governments wished to retain, for a temporary (initially 3, then under the 4R Act, 5 year) period. But in order to obtain this subsidy, the states were required to develop state rail plans for approval by the Federal Railroad Administration of the Department of Transportation. The plans must be updated annually. The Federal government prescribes rather precisely the nature of the plan volumes.

As of January 1, 1979, the states affected by the 3R Act have completed their third updates, and a number of other states have completed their first plans, or at least Work Progress Statements.

This paper provides a survey and analysis of the approaches and policies of 37 states, 6 of these having progress statements only, the remainder plans and plan updates. All states affected by the 3R Act are included, plus those western, southern and New England states from which plans were available.[1]

The plans are prepared, in most states, by the State Department of Transportation; where no such agency has been formed, commonly by the State Highway Department. The majority are prepared by state personnel, some with assistance from outside consulting firms, and a few entirely by consulting firms (e.g., Florida). Because of the Federal requirements and suggestions, there are many common elements, including a description of the existing rail system (in some states, e.g., Maine, very detailed), and a statement of goals and objectives, stressing the importance of the rail system to the economy of the state and of preserving a viable private enterprise rail system. Almost all regard state assistance programs as of a temporary, transitional nature. The primary emphasis is upon light traffic lines, since these are the ones for which subsidy is available. Some include analysis of all of the endangered lines--those for which abandonment has been approved or requested, those contemplated for abandonment in the next three years (category 1) or under consideration (category 2).[2] Others have limited

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[1] In addition to the 3R states, Maine, New Hampshire, Vermont, North Carolina, Florida, Alabama, Georgia, Louisiana, Tennessee, Missouri, Kansas, Minnesota, South Dakota, Arizona, Washington, Idaho, and Oregon provided rail plans, and Nebraska, Colorado, Montana, Nevada, Texas, and Wyoming, progress reports. Some other state plans are completed but were not made available.

[2] J. F. Due, DOT's Classification of Rail Lines, The Prospective Abandonment Proposals of the Railroads, and the Hall Commission Report, University of Illinois, College of Commerce, Working Paper #461, Urbana, 1978.

their first plans to lines actually up for abandonment currently or for which abandonment has been approved. Analysis of the results of the subsidized lines is included in the plan updates of the 3R area states.

An important background element for an understanding of the plans is the existence in several states of constitutional restrictions on their ability to participate in the programs. The constitutions of Ohio and Washington bar both the states and local governments from giving aid to private enterprise (although Ohio can purchase rail lines). In Arizona state aid to corporations is barred. Virginia cannot use state funds for internal improvements except roads and parks, and Kansas can use funds only for waterways and highway improvements, but in neither state are the local governments so restricted. In other states in the sample there are no constitutional barriers, and some of the legislatures (and in Maryland the voters) have given very broad powers to the state transportation departments to participate in the programs.

The General Attitude of the States Toward Assistance of Rail Lines

A very wide range of attitudes toward the programs is to be found in the various states. In general, strongest acceptance is to be found in the eastern states, hardest hit by rail bankruptcies and prospective and actual abandonments. Vermont, Connecticut, and Massachusetts are perhaps the most enthusiastic, stressing that the programs seek to phase in the deteriorated lines, not phase them out. New York and Pennsylvania, although now not as enthusiastic as initially, have active programs, and Maryland, Delaware and Virginia have cooperated to save the Delmarva lines. West of the Alleghanies, Michigan has been the most active and

enthusiastic; Wisconsin, Illinois, South Dakota, Iowa, Minnesota, and Oregon all express sympathetic attitudes toward rail programs. The problems, of course, differ widely; South Dakota is faced with the possible loss of half its rail mileage, Wyoming with very little. Indiana, Ohio, and New Jersey, while participating, have not shown sympathy that other eastern states have. Several states take a negative view, even for their endangered lines: Kansas, Missouri, Nebraska, Arizona, Nevada, and Washington. Some of these have few or no deteriorated lines and little threat of abandonment, but others, such as Missouri, face more significant problems. This difference in attitude, while explainable partly by circumstances of the rail systems of the states, also reflects general differences in philosophy of the state governments and specifically of those persons making the decisions. The sharp difference in attitude between Oregon and Washington, and between Illinois and Indiana, for example, cannot be explained in any other way.

The Approaches

The 4R Act provided Federal assistance for four purposes, in addition to preparation of plans:

1. Subsidies to ensure continued operation under the 4R Act. The Federal share was 100% the first year, dropping to 80% and then to 70%, the original program expiring in 1981. The 1978 legislation[1] extends the program, but subsidy on any line is limited to three years.
2. Funds for rehabilitation of lines. As a result of the 1978 legislation, this program will continue indefinitely, the

[1]Local Rail Services Assistance Act, 1978.

Federal government providing 80% of the funds--but a limited total amount.

3. Funds for acquisition of lines.
4. Funds for provision of alternative means, such as loading docks on other lines.

The states have differed greatly in their relative emphasis on these alternatives, partly in view of circumstances of the lines (some states have little or no need for rehabilitation of track, all of which is in acceptable condition).[1] But beyond this, the choice has been dictated by the attitudes of the decision makers. The difference is in emphasis; many states use more than one approach or plan to do so. The current trend is toward increased stress on rehabilitation.

Continuation Subsidies

When the 3R Act was passed, the immediate task was to ensure continued operation of lines that were excluded from CONRAIL but which the states, local governments, and/or shippers regarded as essential. The only way to ensure continued operation was the provision of a subsidy to cover deficits.

The states fall into four patterns in their attitudes toward these subsidies:

Ten 3R states have used state funds to provide the subsidies. Six of these (Rhode Island, Connecticut, Massachusetts, Michigan, Delaware and Illinois), plus Vermont, have, with minor exceptions provided all of the necessary non Federal funds. New York did so initially, but has moved toward "negotiated solutions", under which the state will

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[1]For example, Oregon has very little mileage below Class II standards.

Federal share from state sources, shippers being required to provide the other half. Wisconsin has subsidized car ferry operations. All of these states indicate the desirability of eliminating the subsidy by restoring the lines to profitable operation, but four, Michigan, Vermont, Connecticut and Wisconsin, indicate willingness to provide subsidy on essential lines over a substantial period of time. Indiana has likewise provided subsidy from state funds but stresses that this is a temporary transitional policy and is moving toward shipper financing. A second group of states, in territory not covered by the 3R Act, indicates willingness to provide subsidies for essential lines but stresses that no long term subsidy is anticipated: Minnesota, South Dakota, Colorado, Idaho, Montana, Tennessee, New Hampshire, and West Virginia. Most of these states will require shipper participation.

A third group either will not for policy reasons or cannot for constitutional reasons provide state funds, but encourages local and/or shipper financing of the subsidy: Maryland (counties), Virginia (district), Louisiana, Nevada, Florida, New Jersey, Ohio (shippers) Nebraska, and Oregon (at least initially). The general reasoning followed is that the benefits from continuation are primarily local rather than statewide, and if local sources provide the funds, they will be more concerned about increasing the traffic. Some state administrations are reluctant to ask their legislatures for funds, given the prevalent anti-tax attitude.

The final group opposes any operating subsidies as a matter of principle, condemming them as mere palliatives--though these states will not prevent local groups from providing them: Arizona, Kansas, Georgia, and Washington.

Subsidy to date has been limited to the states covered by the 3R Act; as of early 1979, other states are just commencing to consider or establish them. Table 1 presents a summary of the actions and Table 2, the expenditures. The data are not summarized in most state plans but were compiled from information on the various subsidized lines; they may not be entirely accurate but give an approximate figure. The numbers-of-lines figures are not consistent among states or even over time within a state because of varying interpretation of what constitutes a "line".

Success with the programs has varied. It is not possible to review the experience in detail, but some observations are feasible. Several of the eastern states particularly affected by the formation of CONRAIL sought to retain a substantial portion of the mileage excluded from CONRAIL. Connecticut, Massachusetts, and Rhode Island retained under subsidy much of the excluded mileage (and as noted below) have purchased various lines. These programs are all being continued, and despite problems, particularly in rehabilitation, are considered by the states to be successful. Michigan sought to retain a substantial portion of the excluded lines, including the entire Ann Arbor and the Great Lakes ferry system, initially retaining under subsidy 854 miles, although recognizing that some should be phased out. Illinois retained over half of the excluded mileage (and most of the rest was absorbed by other roads) and continues to subsidize this mileage. Two lines are close to becoming profitable.

Delaware, Maryland, and Virginia cooperated to retain the Delmarva-Cape Charles through route, including the ferry, and the East Shore

TABLE I. STATE RAIL FREIGHT CONTINUATION SUBSIDIES PROGRAMS TO DATE, DEC. 1978

State	Excluded from Conrail		Initially Considered for Subsidy				Subsidized 1976-77		1977-78		1978-79		Mileage Purchased	
	Lines	Miles	Lines	Miles	Percent Total Mileage	Percent Traffic	Lines	Miles	Lines	Miles	Lines	Miles	Actual by 1978	Planned
Connecticut	11	93	4	34	36	na	4	34	4	34	4	34	145[5]	84
Delaware	10	56	6	50	89	na	5	49	5	49	5	49	0	27
Illinois	17	284	5	173	61	na	5	173	5	173	5	173	0	27
Indiana	28	734	15	382	52	90	13	382	8	118	11	322	0	0
Maryland	17	292	12	162	55	na	12	162	11	162	na	na	0	0[8]
Massachusetts	14	140	7	83	59	na	6	76	6	76	7	88	36	58[7]
Michigan	40	1108	32	921	83	na	29	886	26	864	24	841[3]	153	na
New Jersey	28	210	18	141	67	na	11	102	5	27	5	27[4]	38	41
New York	47	993	33	639	64	99	30	537	28	518	21	381[6]	0	0
Ohio	62[2]	886	22	336	38	82	19	226	17	179	13	153	0[1]	367
Pennsylvania	73	930	63	508	55	na	50	508	46	445	na	na	47	182
Rhode Island	3	22	3	22	100	na		22	3	22	na	na	10	9
Vermont[9]	0	0	—	--	--	--		277	3	277	3	277	277	--
Virginia	1	92	1	92	100	na		92	1	92	1	92	0	0

Note: The figures should not be regarded as exactly accurate, but have been developed as precisely as possible from the state rail plans. The "number of lines" figures are not entirely comparable among states or in one state over time, due to different concepts of a "line". Not all the lines shown as subsidized actually require subsidy.

1. Plus 67 miles by SEPTA.
2. In addition, 58 lines, with 443 miles, were out of service and not considered.
3. No state subsidy; based on expectation of shipper subsidy. There was also hope that 3 lines, 18 miles, might be subsidized
4. 3 lines, 48 miles, will be phased out; 2, with 26 miles, will be off subsidy.
5. Most of this (120 miles) is right of way only, without rail.
6. 4 additional lines, 23 miles, are approved for subsidy if shippers will provide the non-Federal share.
7. Substantial.
8. Plus 88 miles nonoperated lines. The mileage already purchased is technically owned by MBTA.
9. Lines acquired prior to 3R Act.

TABLE 2

Total Freight Continuation Subsidies, Year Ending in 1978

State	Amount of Subsidy 000	Subsidy Per Mile Subsidized	Total Subsidy as a Percentage of Total State Tax Collections for 1978
Connecticut	$ 324	$ 9,530	.2
Delaware	220	4,489	.2
Maryland	1,019	6,290	.1
Massachusetts	885	11,645	.02
Illinois	1,046	5,716	.02
Indiana	4,686[2]	39,712[4]	.2
Michigan	11,903	10,722	.3
New Jersey	415	15,444	.01
New York	4,319	8,338	.04
Ohio	1,562	8,726	.03
Pennsylvania	1,345[3]	3,022	.02
Vermont	525	1,895	.2
Rhode Island	30	1,364	neg.
Virginia	700	7,609	.04
Wisconsin	1,300[1]	--	.05

1. Car ferry only.
2. Including car ferries.
3. Expected to fall to $118,000 in 1979.
4. Excluding car ferries.

Source: State Rail Plans, 1977 and 1978 updates.

branches and have been successful, despite problems with bad track and earlier inadequate cooperation from CONRAIL.

New York initially was overambitious, taking the view that all of the excluded lines were viable. About half of the excluded mileage was in fact subsidized, but the state pushed very rapidly toward negotiated solutions, whereby the railroads, shippers, and labor must agree on a solution to retain a line without state subsidy, following state aid for rehabilitation. The traffic has tended to decline, and more lines have been eliminated than anticipated, but there has been substantial rehabilitation and rationalization and reduction in unneeded mileage by creating new connections. The general attitude is that while the original program attempted too much, a number of essential lines have been saved.

Pennsylvania's philosophy was somewhat similar, except that it requires the shippers to finance one half of the non Federal subsidy share. A large number of lines were retained under subsidy, many of them very short, but each year several have been dropped, either because the shippers would not put up the funds or new connections made segments unnecessary. As subsequently noted, the state has purchased substantial mileage.

New Jersey, which subsidizes passenger commuter service extensively, will not use state funds to subsidize freight service. A relatively small mileage was retained under shipper and Federal subsidy. Vermont, which subsidizes only state owned lines, has provided substantial amounts for the Lamoille Valley line, but no subsidy has been needed for the ex-Rutland lines.

In the midwest neither Ohio nor Indiana have been as enthusiastic as their neighbors. Ohio was hampered by constitutional restrictions that make it impossible even to pass federal money through the state to railroads. But it has facilitated shipper participation. The mileage subsidized has fallen steadily, as shippers have been unwilling to provide the larger amounts as the Federal share fell. Indiana was in danger of losing some major branch lines, but the state was unsympathetic to the subsidy program from the beginning, stressing the argument that the railroads should be required to cross subsidize unprofitable but essential lines. But the state did subsidize some 15 lines. Except on two lines, traffic fell, and 5 lines were discontinued at the end of the first year. The following year (1978) the results were less disappointing, and three additional lines were brought back into service, but with shipper subsidy only.

Table 3 indicates the traffic originated/terminated by the subsidized lines; most fall within the range between 10 and 40 carloads per mile, as would be expected. These are the marginal lines, carrying enough traffic to be of significance to shippers but not enough, under usual conditions, to be profitable. But 30 of the lines--32 percent of the total--have traffic in excess of 50 cars, and a third of these, over 100--a traffic volume that should be profitable, and retention of the lines is almost certain to be economically justifiable.

It must be recognized, of course, that cars originated/terminated per mile is only a very crude measure of traffic density, but it is the only measure generally available in the state rail plans. Net ton

TABLE 3

Traffic Density of Subsidized Lines,
Latest Year Available (1977-78, 1978-79)

Carloads Originated/ Terminated Per Mile	PA	NY	OH	RI	MI	VT	MA	IL	Total
Under 5	1	0	0	0	3	0	0	0	4
5-9	2	2	0	0	2	0	1	0	7
10-15	6	2	0	0	1	1	0	1	11
16-20	5	3	3	1	0	0	2	2	16
21-30	5	4	6	0	0	0	0	1	16
31-40	3	3	0	2	0	0	1	0	9
41-50	0	0	0	0	1	0	1	0	2
51-75	7	3	1	0	1	2	0	1	15
76-100	2	2	1	0	0	0	0	0	5
Over 100	5	1	2	0	1	0	1	0	10
Median	29	26	22	—	8	—	27	20	22
Total									95

Source: State Rail Plans 1978, and Updates, 1977, 1978.

miles per mile, a much better measure, depends not only upon cars originated/terminated, but also on the total mileage of the line, the average length of haul on the line, and the average tonnage per car. But even net ton miles per mile is not an adequate measure, since the off-line mileage of the traffic handled on the lines will vary substantially, as well as the cost of operating the line, the frequency of service required, and the revenue per ton mile, which is dependent upon the commodities handled, intermodal competition, and the general freight rate structure affecting the line.

On the whole, to date, the subsidy program would appear to be clearly justifiable, in saving a number of lines of obvious economic significance. But some programs were overambitious, including lines of limited traffic potential. But the main lesson from the data is that the great majority of the lines are likely to be in the range in which they are not quite self supporting yet may be economically justified.

Analysis by the States of Endangered Lines

Most of the states have commenced to review the lines that for which abandonment has just been approved or abandonment has been requested, and, in many states, the other endangered lines--those in Categories 1 and 2. The proposed abandonment of the portion of the Milwaukee west of Montana plus many lines of that road in other states has greatly increased concern over the endangered category.

Table 4 shows the traffic originated/terminated on the endangered lines analyzed (many of the weakest lines were not included at all in the analysis). The median is only 12 cars per mile, half of that for the currently subsidized lines.

TABLE 4

Traffic Originated/Terminated on Endangered Lines,
States Not Affected by 3R Act

Carloads Originated/ Terminated Per Mile[1]	Number of Lines													
	IL#	WI#	MN	SD	TN*	LA	WA	MO	AL	OR	WV	KS	ID	Total
Under 5	6	6	2	1	0	1	9	1	7	9	1	3	8	54
5-9	0	5	5	5	4	1	0	4	1	2	0	0	1	28
10-15	3	8	1	5	1	2	2	1	0	1	0	2	0	26
16-20	2	5	0	4	2	1	0	1	1	0	0	0	0	16
21-30	3	5	2	7	0	3	0	0	0	0	1	0	0	21
31-40	2	4	1	0	1	1	0	0	2	0	0	0	0	11
41-50	0	3	0	0	1	1	1	0	0	0	0	0	1	7
51-75	0	3	0	0	0	0	1	0	1	0	0	0	0	5
76-100	0	2	0	0	0	1	0	0	0	0	0	0	0	3
Over 100	0	3	0	1	0	4	0	0	0	0	0	0	0	8
Median	8	21	7	16	21	26	--	9	--	--	--	4	--	12
Total														179

#Affected to a limited extent by the 3R Act.

*Including one Virginia line.

[1]Latest year available, typically 1977.

Table 5 shows the proposed action by the states on the endangered lines. For the states as a group, no action to save the lines was proposed on 48% of the mileage, possible action to retain on 35%, the rest for rail banking or further consideration. Some states, such as South Dakota, proposed action to retain half or more; others, such as Arizona, did not propose retention of any. Of the states with current subsidy programs that have reviewed endangered lines, neither Michigan (5 lines) nor Virginia (4 lines, 47 miles) proposed retention of any (except a one half mile segment in Michigan). New York state expressed no objection to abandonment of 11 lines in Category 1, but to all lines proposed in Category 2. Ohio examined 28 lines, 430 miles, in 1978, and proposed subsidy--if shippers will provide the money--for 12 lines, 331 miles. Maryland with 8 segments with 86 miles concluded that 5, with 60 miles, warrant subsidy (but the state does not provide funds).

The states not covered or only partially covered by the 3R Act fall into two patterns: those with most of the lines under 15 cars (Oregon, Idaho, Washington, Illinois, Wisconsin, Minnesota, Missouri, and Kansas) and the majority over 15, in South Dakota, Tennessee, Wisconsin, and Louisiana. This difference reflects in part the policy of the Illinois Central Gulf, particularly in Louisiana, seeking to abandon lines that are profitable but earning less return than other lines requiring capital, the same policy of the Milwaukee, and the seriously deteriorated condition of many of the light traffic lines in South Dakota and portions of the other states, which will necessitate large reinvestments if the lines are to stay in service.

TABLE 5. ACTION OF THE STATES NOT PREVIOUSLY ENGAGED IN SUBSIDY PROGRAMS ON ENDANGERED LINES

State	Total		No Action to Retain		Further Study Warranted		Retention Desired		Rail Bank	
	Lines	Miles	Lines	Miles	Lines	Miles	Lines	Miles	Lines	Miles
Alabama	12	183	9	113	0	0	2	64[4]	1	6
Arizona	3	80	3	80	—	—	—	—	—	—
Florida	21	286	13	121	1	29	7	94[1]	1	42
Idaho	10	347	10	347	0	0	0	0	0	0
Kansas	8	196	4	76	4	120	—	—	—	—
Louisiana	14	439	11	310	—	—	3	129	—	—
Maine	8	126	2	35	2	28	2	37	2	26
Minnesota	22	526	14	273	1	33	7	220	—	—
Missouri	10	248	6	39	4	209	—	—	—	—
Oregon	10	129	8	77	0	0	1	45	1	7
South Dakota	35	1871	16	619	—	—	14	921	5	331
Tennessee	9	246	2	49	4	40	4	157	—	—
Virginia*	4	47[3]	3	38	1	9[2]	—	—	—	—
Washington	6	175[3]	4	62	1	51[2]	1	62	—	—
West Virginia	14	211	12	143	0	0	2	68[5]	0	0
Wisconsin	48	1249	22	680	9	156	17	413	0	0
Total	234	6359	139	3062	27	675	60	2210	10	412

*Only a small segment of the state was affected by the 3R Act; one line has been under subsidy.

1. 2 lines, 19 miles temporary only.
2. The rail line between Port Townsend and Port Angeles. Rail barge service would be provided at each end if rail abandoned.
3. The trackage rights are excluded from the total.
4. 22 miles require rehabilitation, 42 miles temporary subsidy.
5. Including 8 lines, 243 miles, shown to be profitable.

Note: Totals of numbers of lines do not agree with the sums of the figures indicated in the various columns because of segmentation of some lines in the solutions.

Table 6 shows the relationship of the cars originated/terminated and the subsidy per car necessary to keep the line in operation. The precision of the results is lessened by the variation among the states in the extent to which rehabilitation costs are included; for the most part these are excluded as being a temporary element. No adjustment is made for varying length of lines.

Thus, with lines under a 5 car density, 18 of the 22 lines require a subsidy over $1,000 per car per year, and 21 of the 22 over $600; these are prohibitive figures, except for very short periods and would never be paid by shippers except under the most unusual circumstances.

Of the 11 to 24 group, 56% require a subsidy in excess of $300, while of the 25 to 50 group, 76% require less than $300; over 51, 98% require less than $300 a car, 77% under $100--and many of these, nothing.

Table 7, using the data of three states, Michigan, Wisconsin, and Illinois, shows the relationship between the traffic and the benefit-cost ratio and produces results similar to those of Table 6, though with some deviations. Of the lines with less than 5 cars, 13 of 18 have a B/C ratio under .5 and of the 5 to 9 group 13 of 19 have a figure under 1. Of lines with more than 15 cars, all except 2 of the 40 lines have figures in excess of 1, and 16 have figures in excess of 4, indicating justification for retention, even though a substantial number of these lines would require subsidy in excess of amounts shippers are likely to be willing to pay. Most of the other states do not provide comparable B/C ratios; figures for Ohio were omitted because the formula is such that most subsidized lines show a figure under 1.

TABLE 6

Relationship Between the Traffic Originated/Terminated and the Subsidy Required Per Loaded Car, As Shown in State Rail Plans

Subsidy Required per Car, Dollars	Cars Originated/Terminated Per Mile of Line, Per Year						
	Under 5	5-10	11-24	25-50	51-100	over 100	TOTAL
Under $100	0	0	9	15	17	19	60
100-300	0	4	23	14	7	3	51
301-600	1	11	29	7	1	0	49
601-1000	3	18	10	2	0	0	33
over 1000	18	10	1	0	0	0	29

Source: State Rail Plans and Updates, Minnesota, Illinois, Ohio, Pennsylvania, Michigan, Maryland, New York, Wisconsin, South Dakota, Louisiana, Missouri, Ohio, Vermont. Both subsidized lines and endangered lines are included.

TABLE 7

Relationship Between the Traffic Originated/Terminated and the Benefit Cost Ratio, States of Michigan, Wisconsin, and Illinois

Benefit/ Cost Ratio	Cars Originated/Terminated Per Mile					
	Under 5	5-9	10-15	16-30	31-75	Over 75
Under .5	13	4	4	2	0	0
.5-1	1	9	4	0	0	0
1.1-2	4	2	2	7	5	0
2.1-4	0	3	1	8	2	0
Over 4	0	1	1	3	9	4

Source: State Rail Plans.

The Rehabilitation Approach

Directly and immediately the lines excluded from CONRAIL could be saved only by operating subsidy, and this is true of some lines for which abandonment is currently sought in other areas. But it was widely recognized that many of the excluded and endangered lines had lost traffic and experienced higher costs because of badly deteriorated track. In fact many of the lines the states sought to retain were not operable because of the track condition. For example, in Connecticut, virtually all of the excluded mileage was below Class I standards. The Delmarva lines were in similar condition, as is true of many branch lines in the midwest.

Thus the principle has been accepted in many states that if the lines are rehabilitated, subsidy will no longer be necessary, a premise that is not necessarily valid. In addition, shippers will be given confidence that the lines will be continued indefinitely. All of the states that have programs under way have used some of the Federal money for this purpose, and most have provided the nonstate share themselves. Massachusetts, for example, is supplying substantial funds to rehabilitate all of the retained lines, some to Class II standards. Of the states not yet involved in the program, several stress this approach (Georgia, for example) in lieu of operating subsidy. Many of the Rocky Mountain and Pacific states, however, have little or no deteriorated mileage.

The state of Iowa developed a program of rehabilitation of deteriorated light traffic lines well before the enactment of the 4R Act, and this has been carried forward. This approach involves a contractual

agreement for rehabilitation of a line whereby the shippers, the railroad and the state each provide one third of the funds, the shippers being subsequently repaid on the basis of traffic. Any increased revenues from the project are shared with the state, thus returning the funds for use in upgrading other lines.

Two states in the sample stress the use of this approach in the rehabilitation of rail lines, either endangered lines or deteriorating ones: Minnesota and South Dakota. The former has allocated $3 million a year for this purpose; agreements have been concluded on two lines and near completion on a third. Louisiana also is considering this approach for rehabilitation.

A basic difficulty with both the 3R and 4R Acts was that Federal funds could be utilized only after abandonment had been approved--yet the optimal time for rehabilitation was prior to this point. The 1978 Local Rail Services Assistance Act eliminated the abandonment requirement and allows use of Federal funds on local rail lines with gross ton miles per mile under 3 million, and with Federal approval, from 3 to 5 million. Furthermore, the program is now established as a permanent one. The ratio of Federal assistance has been set at 80.

A major question that can be raised is: if lines can be made profitable by rehabilitation, why did the railroads allow them to deteriorate and why do they not rehabilitate them on their own? The roads allowed the lines to deteriorate because they were relatively short of funds, and they do not rehabilitate them because of the shortage of capital. Such capital as they have access to is devoted to the most pressing needs, often on main lines. Furthermore, governments can of course raise funds more cheaply than hard pressed private firms.

Acquisition of Lines

While rehabilitation funds are provided or will be provided in a number of states, actual state acquisition of lines--right of way, track, and in some instances equipment--is a policy accepted by a smaller number of states, and views differ sharply. Some acquisition, as noted, by states such as Vermont, predated the 3R and 4R Acts. Vermont had acquired two major routes, 277 miles, 37% of the rail mileage in the state, in 1963-64 and 1973, for a total of $3.9 million. Under the provision of the Acts, little mileage has actually been acquired to date, partly because of difficult negotiations between Penn Central, owner of most of the excluded lines, and the states.

Currently to date, Connecticut, New Jersey, and Pennsylvania have been the most active. A prime goal of the state is to assure the shippers of the permanence of the lines. A major obstacle to the building up of traffic on subsidized and endangered lines is that the assistance will not continue. Connecticut has followed a policy of seeking to purchase all of the subsidized lines plus a substantial mileage of abandoned lines and rights of way. Massachusetts has already purchased three of the subsidized lines and some nonoperated mileage and plans to purchase the remaining subsidized mileage. Rhode Island has purchased one of the three excluded lines, has been negotiating for a second, and was willing to purchase the third, which was acquired by a short line. New Jersey stresses acquisition of passenger trackage as well as light density rail freight lines. Pennsylvania and SEPTA--Southeast Pennsylvania Transportation Authority--likewise followed the policy of acquiring excluded mileage. New Hampshire has

purchased two lines and leased them to short line operators, and West Virginia has acquired and is operating one line and negotiating for a second.

Other states have placed less stress on this approach. Michigan acquired a portion of the former Ann Arbor trackage and is considering the acquisition of additional lines for rail banking or short line operation. Ohio is now acquiring some mileage, partly for rail banking, partly for operated lines. Delaware, Wisconsin, Virginia and Maryland are considering limited acquisition. New York, which earlier acquired the Long Island and the non-operated Lake Placid branch, was unwilling to acquire trackage on the grounds that other uses of the funds are more essential. But the 1978 Plan Update indicates that this policy is being reevaluated. The state estimates that $50 million would be required to purchase the relevant lines. Several states indicate specifically that they will not consider purchase and others do not mention the option.

Table 8 shows planned expenditure for rehabilitation and acquisition, as of 1978.

Methodology for Establishing Priorities

Since Federal funds are limited, the states obviously had to establish priorities for selection of lines to be retained, at least with the aid of Federal funds, and, as a practical matter, with their own funds as well. The methodology was suggested to the states by the Rail Services Planning Office in 1975,[1] and the various items suggested are mentioned in most of the plans, although with varying

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[1] Guide for Evaluating the Community Impact of Rail Service Discontinuance, January 10, 1975.

TABLE 8

Planned Expenditures for Rehabilitation and Acquisition of Rail Freight Lines, 1978

State	Planned Expenditures, Rehabilitation	Planned Expenditures, Acquisition of Lines
	Thousands of Dollars*	
Connecticut	1,662	2,492
Indiana	3,643	--
Maryland	6,818	--
Michigan	9,599	--
New Jersey	1,932	2,748
New York	14,094[1]	75[2]
Ohio	na	5,500[3]
Pennsylvania	2,828[3]	4,558[3]
Virginia	1,422	--
Wisconsin	--	6,992[4]
Massachusetts	4,386	4,206
Vermont	6,000[5]	3,900
Rhode Island	1,897	400
New Hampshire	na	1,310
West Virginia	4,000	650

*1977-78 fiscal year unless otherwise noted.
1. Projected, as of 1978 update.
2. Funds allocated.
3. Estimated, on lines that will likely rehabilitate and/or acquire.
4. Appropriated.
5. Total program for the Lamoille Valley.

Source: State Rail Plans.

emphasis. This guide was reinforced and elaborated on by the Rail Planning Manual issued by the Federal Railroad Administration. But the exact approaches vary substantially, and they do not lend themselves to a neat classification. The 1978 legislation prescribes a benefit/cost formula more precisely.

All of the approaches involve some consideration of the benefits from retention of a line and the costs of preserving it. On the benefit side, the major elements mentioned--hut with varying stress--are as follows:

1. Potential loss in jobs and wages, both directly from firms closing down and indirectly from the effects of the direct loss. The former was calculated from shipper surveys of the effects of loss of rail service, the latter on the basis of a formula relating direct and indirect jobs.
2. Consequent increase in welfare and related payments.
3. Loss in tax revenue--property, income, in some instances, sales.
4. Additional transportation cost, with comparison of the costs by rail and the next-cheapest mode (truck to railhead, truck to water transport, all-truck).
5. Additional highway maintenance costs.

These were all quantifiable in dollar terms (wage, not job, loss). Attention was also given to less quantifiable (in monetary terms) elements: pollution, energy use, noise.[1]

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[1] Abandonment causes energy-use and pollution deterioration only if rail traffic per train exceeds several cars per train, the exact figure depending on the circumstances and whether trucking is to the nearest rail head or to destination.

Substantial estimation is involved in establishing these benefits. Experience shows that shippers may overstate the adverse effects that loss of the rail line will have on them--given their desire to retain the line.

On the cost side, the figure typically used is that of the amount necessary to cover the deficit from continued operation, calculated with and/or without rehabilitation. Initially, the required subsidy was calculated with the use of the RSPO formula of avoidable cost. But there are arbitrary elements involved, particularly the off branch costs of handling traffic to or from the line, and New York State has objected to the RSPO formula on this basis. After a line is actually subsidized, the railroad operating the line provides the figure, calculated on the RSPO formula, but the arbitrary elements remain. If operation is taken over by a short line, the deficit can be more precisely calculated, but the amount depends upon the reasonableness of the rate division, if any.[1]

The techniques vary:

1. Pure Benefit-Cost. Michigan comes closest to using a strict benefit-cost approach. Four of the elements noted above are added to obtain the benefit figure: net decline in personal income, additional unemployment compensation, loss in income and property tax revenue, added transport cost. This is compared with the necessary subsidy.

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[1]The railroads are increasingly reluctant to give short lines a share of the joint rate, thus requiring the short line to charge an add-on rate.

2. Benefit/Cost and other elements. Several states employ the B/C figure along with other elements. Illinois, for example, weights equally the B/C figure, potential for viability of the line, the future relationship of the line to the rail network, and ability of other forms of transport to meet needs of shippers. The last, in turn, depends mainly on the condition of roads and bridges. Wisconsin uses B/C along with other elements relating to local participation, future viability, necessary period of subsidy, and distance from other lines. Pennsylvania uses the B/C figure but stresses subsidy per carload and subsidy per mile (inversely). The present Ohio system is basically a B/C system, but a line will be included only with a written commitment from the shippers to provide the non Federal funds. Washington uses a similar system.

3. Weighted Index System. In an effort to avoid overweighting the quantifiable elements, New York, Wisconsin until 1978, Kansas, Delaware and New Jersey use a ranking system. The various lines are ranked for each of the elements considered--and these are essentially the same as in the approaches noted above. New York, for example, ranks the lines by five categories: business and employment effects, additional consumer cost (from higher transport cost), decline in property tax base, changes in annual sales volume, and pollution effects. The various categories are then weighted on the basis of the relative importance attached to each by a sample of persons. Kansas includes also the volume of traffic on the line, effects on deaths and injuries, and subsidy per mile required.

4. Less Formal Systems. A number of states, especially in the west and south, have not yet developed any precise formula. Many of the elements already noted are included, but with varying emphasis. Massachusetts stresses job losses, as does Florida. Both Minnesota and South Dakota stress the importance of maintaining an overall state network, shipper interest, and future viability. The viability--ability to come off subsidy--is stressed in a number of states as well, as for example, Louisiana, Virginia, Nebraska, and Idaho.

The differences in stress in part reflects circumstances: job losses are particularly serious in Massachusetts, and the danger of loss of rail service in extensive areas of the state in South Dakota.

Lessons from the Experience

There are several major conclusions that can be drawn from the experience with state rail planning and programs to date.

First, the experience with the subsidized lines and the analysis of the endangered lines shows that a significant portion of the lines excluded from CONRAIL or which the roads seek to abandon have sufficient traffic that they should be self supporting--and significant economic waste would result from abandonment.

Secondly, on the other hand, a substantial mileage of the endangered lines have so little traffic that retention is clearly unwarranted; the fact that the lines have survived this long is evidence of the slowness with which many railroads acted to eliminate light traffic lines; very few of these lines had ever been subject to abandonment requests.

Third, a major portion--at least half--of the subsidized and endangered lines are strictly marginal, with sufficient traffic that shippers and communities will be injured by abandonment, yet the traffic is not such as to allow them to be self supporting. These lines require careful benefit-cost analysis to determine those that warrant continued subsidization.

Fourth, state experience with subsidization thus far has been very mixed. Some states were overambitious initially and have cut back. Others have seen the traffic on the subsidized lines fall. But other lines have experienced traffic increases; some are off or about to come off subsidy; and some states are well satisfied with their programs.

Fifth, it is clear that some of the excluded and endangered lines are profitable lines but the railroad owners are unwilling to use scarce capital to rehabilitate them. This is particularly evident in the analysis of Illinois Central Gulf lines in Louisiana and Milwaukee lines in Wisconsin. These lines should require no subsidy once Federal funds are used for rehabilitation. But it is equally clear that many of the marginal lines cannot be self supporting even with rehabilitation.

Sixth, the willingness of shippers to provide a portion of the subsidy is clear indication that the rates to points on the line were uneconomically low; with rate deregulation some of these lines should become profitable. But other marginal lines cannot be preserved by shipper subsidy alone--especially when there are several shippers and they cannot agree on division of the subsidy.

The most significant general conclusion is that legislation allowing the railroads to abandon any lines they please, without provision for retention through subsidy, would cause serious economic loss.

Evaluation of the Overall Program

The Federally sponsored subsidy program has accomplished one major objective: it has established the principle that unprofitable but economically justifiable rail lines should be retained under public subsidy, not cross subsidy by the railroad company. In the past the I.C.C. had only two alternatives: allow abandonment or force the road to continue to cross subsidize. At a relatively small cost, a number of lines have been retained that are clearly justifiable economically, and the states have been relatively selective in not retaining, at least beyond a transitional period, lines that clearly are uneconomic.

Secondly, the 3R and 4R Acts have led to the development of state rail planning. No longer do the State governments regard the railroads as merely an industry to be regulated and taxed, but they are commencing to see rail transport in a positive fashion, as a key element in the transportation picture of the state and the nation, and one that warrants encouragement and support. The State rail planning process has required each state to take a careful look at the State's rail industry, its strengths and weaknesses, to investigate the effects of rail deterioration upon the economy of the State, and to consider alternative solutions to the difficulties. The plans represent a step--although a small one in many instances--toward overall transportation policy planning, including all modes of transport.[1]

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[1]The most comprehensive overall planning, considering overall transport requirements and all modes, is now being undertaken by South Dakota. Most plans still fail to recognize the full impact of "subsidizing" many roads on the viability of competing light traffic rail lines.

The plans generally recognize that continuation of rail service may offer significant positive externalities, in the form of lessened pollution, lessened highway congestion and construction needs, and preservation of existing patterns of economic activity, as well as ensuring a broad geographical base for growth of various types of activities. There is, however, a tendency to stress jobs lost as the major impact of abandonment--when in fact the frequent effect would be to shift jobs from one location in the State to another. Thus externalities from a local standpoint are greater than those from a State standpoint.

Despite the wide variety of approaches, it would appear from superficial evidence that the States have been successful in identifying the lines that most clearly warrant subsidy, although obviously further refinements are required to handle the marginal cases.

The plans provide a somewhat incidental function of bringing together data on the rail systems of the States not previously available.

Defects in the Overall Program - Stress on Shipper Support and the Temporary Nature of the Programs

There have been several weaknesses in the program, some fundamental, some caused by particular features of the laws.

First, there has been great emphasis on the need to make the lines self supporting, either through the regular rate structure or additional payments by shippers. Some states have refused to provide any state funds, requiring the subsidy to come from shippers or local governments.

But shipper subsidies place firms on the line at a disadvantage in competition with shippers on unsubsidized lines and affect location decisions, increasing the danger that the line cannot survive. When there are a number of shippers, it is difficult to get them to agree on allocation of the total subsidy payment among them. Local governments are typically hard pressed for revenues and are unlikely, in most states to provide the necessary funds--particularly if it appears that much of the gain goes to a few shippers. While it is true that many of the benefits are local, a case can be made for state financing in the interests of facilitating development in all parts of the state, and in view of the better financial resources of the state. Because some of the direct gain goes to the shippers on many lines, some financial participation by shippers is obviously justifiable.

There are two situations in which continuing non shipper-subsidy may be warranted: 1. When there are true externalities from retention of a line, as for example, reduced pollution, energy use, highway congestion and highway construction costs, and from a community standpoint, maintenance of jobs and opportunities for economic development requiring rail service. 2. When incremental (marginal) cost is less than average cost, as it almost always is on light traffic lines because average cost declines rapidly as traffic volume increases. If the line is economically justifiable, in the sense of providing lower transportation costs than otherwise possible, and no rate structure can be devised that will allow users to cover average cost, subsidy is warranted.

Closely related to the emphasis on shipper support is the basically temporary nature of the continuation subsidies. Federal aid will be limited to three years in the future, and almost all of the states regard their programs as temporary; not more than three or four recognize the possible desirability of continuing the program once the Federal share ends. But it is clear that a number of the lines cannot be made profitable but their externality contribution, together with the sharp difference between marginal and average cost, require continued subsidy if economic welfare is to be maximized.

As a consequence of the feared temporary nature of the subsidy, especially if the state will not put up funds, it is difficult to attract new traffic to the subsidized lines, thus lessening the chance of their surviving. When states make very clear in their rail plans that certain lines are not likely to survive beyond the subsidy period--as do Indiana and Ohio--shippers will not locate or expand on the line. For this reason some eastern states, particularly Massachusetts and Connecticut, have stressed that the subsidized lines will remain as permanent elements in the rail systems, and have provided funds for acquisition and rehabilitation.

This stress on the temporary nature reflects several considerations. First, there is widespread belief that the marginal lines can become profitable once they are rehabilitated; this is the attitude of Congress in making this portion of the program permanent in the 1978 legislation. Certainly some lines can become profitable by this means, but many cannot. In part the attitude reflects the basic dislike of any form of operating subsidy.

Objections to Subsidy and the Short Line Alternative

However justifiable subsidies may be in principle, satisfactory implementation is difficult, as long experience in air transport and elsewhere has demonstrated. The railroads operating the lines have no incentive to hold costs down and little to improve service, and incentive to allocate as much cost as possible to the subsidized lines. RSPO formulas seek to prevent this, but this is difficult. As one consequence, and also a consequence of difficulties with CONRAIL, several states have encouraged transfer of lines to new or existing short line railroad companies. Vermont leases its state-owned lines to three such companies. Maryland and Virginia have encouraged the formation of short lines, as has Delaware, although the latter has expressed some reservations about this approach. Michigan has strongly favored the short line approach, and much of the subsidized mileage in that state has been transferred to new enterprises. Illinois and Indiana both favor such takeovers, though Indiana has feared that the unsympathetic attitude of CONRAIL would interfere with further shifts. Rhode Island and Connecticut have encouraged the Providence and Worcester, although Connecticut expresses some misgivings about the approach. Louisiana supports the approach in principle. Most of the western rail plans do not raise the issue at all; Oregon notes the possibility.

The strong critic of the short line approach had been New York, the attitude dating back to a study published in March, 1974.[1] The

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[1] Short Line Railroad Costs in New York State (Albany: New York State Department of Transportation).

basic argument was that there is no net advantage to short line operation. What is required is an adaption by the major roads of their operation of branch lines to changed conditions, rather than transfer of branches to short lines. While the latter may have somewhat lower labor costs, they must carry the entire administrative costs and may experience management problems and inadequate utilization of equipment. In 1978, however, New York altered its position because of its dissatisfaction with CONRAIL and now will encourage short line proposals.

The short line approach, while allowing lower costs and much more attention to the needs of the shippers, does not in itself avoid the inherent subsidization problem. But the direct awareness of the company officials of the danger of loss of subsidy, if it becomes too large, and of direct contact with the operations make them much more conscious about the need to hold costs down than is the management of a Class I railroad that has no great interest in retaining a particular branch. A major obstacle is the reluctance of Class I railroads to provide a share of the joint rate with new short lines, and complete deregulation, as proposed in March 1979, would greatly weaken the bargaining power of the short lines.

The inherent subsidization problem, in turn, suggests the possibility of actual operation of lines by governmental units, state, local, or district. In freight planning all of the states except West Virginia have avoided this approach to date.[1] Many plans note specifically that

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[1] West Virginia has acquired one line, Green Springs to Petersburg, 51 miles, and is negotiating to buy the 17 mile Cass-Durbin line. The Petersburg line is operated by a state agency, the West Virginia Railroad Maintenance Authority, with its own employees and equipment. Substantial amounts will be spent on rehabilitation, with the hope that the line will be self supporting by 1981. The Chessie system gave the line to the state. The Cass line is sought mainly to ensure a connection for the Cass Scenic Railway, a tourist line owned and operated by the state department of Natural Resources and will be operated by the latter.

the state will not become involved in actual operation, even states that have been purchasing the lines. Partly this simply involves the old bias against government enterprises in the transport field, despite the fact that most urban transit systems as well as the Long Island Railroad are governmental operations. Two cities have successfully operated railroads for many years[1] and one new public district came into existence prior to the 3R legislation (the Ogdensburg Bridge and Port Authority). The presumption that government enterprises are less efficient than private is widely accepted--though there is no conclusive evidence. Operation by a governmental authority would eliminate the inevitable clash between government and private firm that arises in any subsidy situation. Pressures to hold costs down to minimize the deficit even if only partially covered from local taxes would be strong.

Two related points have received little attention, though some mention is made of them, especially in New York and Pennsylvania: (1) the much greater economic viability of short light-traffic lines than of long ones;[2] and (2) the consequent desirability of transferring segments of lines from one carrier to another, when overall costs can be reduced by doing so.

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[1] There is one other small operation. A few other cities have operated lines for various periods. Municipal operation is discussed in the article by John F. Due, "The Experience with Municipal Railway Lines," Transportation Journal, Vol. 14 (Summer 1975), pp. 5-17.

[2] John F. Due, "Factors Affecting the Abandonment and Survival of Class II Railroads," Transportation Journal, Vol. 16 (Spring 1977), pp. 19-36.

Other Limitations[1]

A major defect in the territory affected by the 3R Act was the failure to transfer the excluded lines from their railroad owners to CONRAIL or a Federal holding agency. As a consequence, rental charged the present operating companies and thus covered by subsidy are being pushed up rapidly, and the prices Penn Central and other owners are asking are far in excess of liquidation value at the time of formation of CONRAIL. Federal legislation also does not provide satisfactory means of transferring segments of endangered lines from the present railroad to another, which would often allow abandonment of substantial mileage without injury. The plans for restructuring the rail lines in the Prairie provinces of Canada do provide for such rationalization, and New York state has been able to accomplish some.

A defect in the original subsidy legislation, corrected now for the rehabilitation program, was that lines were not eligible for Federal assistance until abandonment was approved. This interferred with rational planning by the states, and often meant that deterioration of lines went much farther than was economical before rehabilitation. The railroads were in the awkward position of seeking to prove that a line was unprofitable and uneconomic and then seek to aid in justifying the retention and rehabilitation of it under subsidy.

Conclusion

On the whole, the programs, Federal and state, have been warranted, despite their defects. The most needed change, continuation of the

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[1] Several limitations are stressed in the article by Mark I. Hirschey, "Rail Service Subsidies--Actual Analysis of the Program," Quarterly Review of Economics and Business, Vol. 18 (Summer 1978), pp. 39-54.

operating assistance subsidy beyond three years, is not without its problems, particularly in providing incentive to hold down costs and provide good service. Transfer to a local company or to a local governmental unit are at least partial solutions. But the establishment of the principle of subsidization and end of cross subsidy, planning of rail system by the states, and retention of lines that were unprofitable but economically justified are important accomplishments. At the moment, proposed deregulation of the railroad increases uncertainty about the future of abandonment and alternatives and the subsidy programs.